



# COURSE CATALOG

## MASTER OF SCIENCE PROGRAM IN PROSTHETICS AND ORTHOTICS (INTERNATIONAL PROGRAM)

SIRINDHORN SCHOOL OF PROSTHETICS AND  
ORTHOTICS (SSPO)  
FACULTY OF MEDICINE SIRIRAJ HOSPITAL,  
MAHIDOL UNIVERSITY  
14 ARUN-AUMARIN ROAD, ARUN-AUMARIN,  
BANGKOKNOI, BANGKOK, 10700 THAILAND

# COURSE CATALOG

Master of Science Program in Prosthetics and Orthotics  
(International Program)

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## DEGREE OFFERED

Master of Science Program in Prosthetics and Orthotics  
(International Program)  
M.Sc. (Prosthetics and Orthotics)

## CURRICULUM STRUCTURE

Subject	Plan A2	Plan B	
Required courses	15	15	Credits
Elective courses not less than	9	15	Credits
Thesis	12	-	Credits
Thematic Papers	-	6	Credits
<b>Total not less than</b>	<b>36</b>	<b>36</b>	<b>Credits</b>

## RECOMMENDED TWO-YEAR PLAN

### FOR PLAN A2

#### 1<sup>st</sup> Year

Semester 1			Credits	
SIID	503	Research Methodology in Biomedicine	2	(2-0-4)
SIPO	541	Seminar in Prosthetics and Orthotics I	1	(1-0-2)
SIPO	543	Medical Science for Prosthetics and Orthotics	2	(2-0-4)
SIPO	544	Advanced Biomechanics and Outcome Measurement	3	(2-2-5)
SIPO	545	Advanced Prosthetics and Orthotics	2	(2-0-4)
XXXX	XXX	Electives	3	(X-X-X)
<b>Total</b>			<b>13</b>	



# RECOMMENDED TWO-YEAR PLAN (CONT.)

## FOR PLAN A2

### 1<sup>st</sup> Year

Semester 2			Credits	
SIPO	542	Seminar in Prosthetics and Orthotics II	1	(1-0-2)
SIPO	546	Projects in Prosthetics and Orthotics	3	(0-6-3)
SIPO	547	Knowledge Translation in Prosthetics and Orthotics	1	(1-0-2)
XXXX	XXX	Electives	6	(X-X-X)
SIPO	698	Thesis	2	(0-12-0)
<b>Total</b>			<b>13</b>	

### 2<sup>nd</sup> Year

Semester 1			Credits	
SIPO	698	Thesis Proposal Defense	5	(0-12-0)
<b>Total</b>			<b>5</b>	

### 2<sup>nd</sup> Year

Semester 2			Credits	
SIPO	698	Thesis Thesis Defense Examination	5	(0-12-0)
<b>Total</b>			<b>5</b>	



# RECOMMENDED TWO-YEAR PLAN

## FOR PLAN B

### 1<sup>st</sup> Year

Semester 1			Credits	
SIID	503	Research Methodology in Biomedicine	2	(2-0-4)
SIPO	541	Seminar in Prosthetics and Orthotics I	1	(1-0-2)
SIPO	543	Medical Science for Prosthetics and Orthotics	2	(2-0-4)
SIPO	544	Advanced Biomechanics and Outcome Measurement	3	(2-2-5)
SIPO	545	Advanced Prosthetics and Orthotics	2	(2-0-4)
XXXX	XXX	Electives	3	(X-X-X)
<b>Total</b>			<b>13</b>	

### 1<sup>st</sup> Year

Semester 2			Credits	
SIPO	542	Seminar in Prosthetics and Orthotics II	1	(1-0-2)
SIPO	546	Projects in Prosthetics and Orthotics	3	(0-6-3)
SIPO	547	Knowledge Translation in Prosthetics and Orthotics	1	(1-0-2)
XXXX	XXX	Electives	6	(X-X-X)
<b>Total</b>			<b>11</b>	

### 2<sup>nd</sup> Year

Semester 1			Credits	
Comprehensive Examination and Thematic Papers				
SIPO	697	Thematic Papers	3	(0-9-0)
XXXX	XXX	Electives	6	(X-X-X)
<b>Total</b>			<b>9</b>	



# RECOMMENDED TWO-YEAR PLAN (CONT.)

## FOR PLAN B

### 2<sup>nd</sup> Year

#### Semester 2

#### Credits

SIPO 697	Thematic Papers Defense Examination	3	(0-9-0)
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<b>Total</b>	<b>3</b>
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## COURSE DESCRIPTIONS

### Required Courses

### 15 Credits

#### SIID 503 Research Methodology in Biomedicine

#### 2(2-0-4)

Various types of research; applications of scientific process in the research design in biomedical sciences; a formulation of research questions and hypotheses; techniques of data collection and information sources in biomedical sciences; a critical appraisal of scientific research articles; research ethics; the animal use for research; the proposal development in biomedical science research

#### SIPO 541 Seminar in Prosthetics and Orthotics I

#### 1(1-0-2)

Literature search in prosthetics and orthotics; an analysis and critical appraisal of prosthetics and orthotics research articles; an evaluation of prosthetics and orthotics research; strength and limitation of the applications of the research findings



**SIPO 542 Seminar in Prosthetics and Orthotics II**

**1(1-0-2)**

Research in Prosthetics and orthotics seminars; technologies in prosthetics and orthotics; prosthetic and orthotic development; presentation of prosthetic and orthotic research; Strength and limitation of applications of the research findings

**SIPO 543 Medical Science for Prosthetics and Orthotics**

**2(2-0-4)**

An integration of medical sciences and prosthetics and orthotics; in-depth analysis of the prosthetist and orthotist roles in medical multidisciplinary team in management of common pathologies including modern clinical practice setting

**SIPO 544 Advanced Biomechanics and Outcome Measurement**

**3(2-2-5)**

An application of advanced biomechanics of prosthetic and orthotic; an analysis of human movement; biomechanical analysis of prosthetic and orthotic experiment technique for the acceleration analysis and force plate; the principle of the 3-D motion analysis, the appropriate system of data analysis and report; an application of various tools used to assess diverse aspects of health including physical ability, quality of life and pain; a selection of appropriate assessment procedures used to measure both baseline status and any change in the status due to healthcare interventions or the natural progression of a condition.

**SIPO 545 Advanced Prosthetics and Orthotics**

**2(2-0-4)**

An application of advanced biomechanics and kinesiology of prosthetics and orthotics, material science and mechanical science; advanced components for prosthetics and orthotics, electronic prosthetics and orthotics which have been controlled by the biosignal and computerized system; Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM); mechanical structure and functions of prosthetic and orthotic components; the treatment plan and care management for people with physical disability and older people; practice in fabrication and fitting



**SIPO 546 Projects in Prosthetics and Orthotics****3(0-6-3)**

The development of project proposals to answer defined clinical questions; a critical analysis of literature; an implementation of research pilot projects; reporting project findings to form conclusions to the clinical questions; formal presentations of project

**SIPO 547 Knowledge Translation in Prosthetics and Orthotics****1(1-0-2)**

Definitions and characteristics of the knowledge translation, basic theories, frameworks, and models in the knowledge translation; the relationship between the knowledge translation and the evidence-based practice; the research design and intervention used in the knowledge translation; an application of knowledge translation in prosthetics and orthotics

**Elective Courses****SIPO 502 Orthotic and Prosthetic Technologies****3(2-2-5)**

Principle and process of advanced material science and mechanical science; prosthetic and orthotic technology, carbon fiber manufacturing, silicon house, advanced prosthetic and orthotic components, Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), and 3D printing technology; mechanical structure and functions of prosthetic and orthotic components; the administration and management in prosthetics and orthotics factories.

**SIPO 503 Health Education in Prosthetics and Orthotics****2(2-0-4)**

Public health; healthy behavior changes; health promotion; interpersonal environmental and societal aspects implications on prosthetics and orthotics; psychosocial perspectives; professional ethics; policy and advocacy





**SIPO 506 Clinical Gait Analysis**

**3(2-2-5)**

Functioning analysis, properties and biomechanics of muscles, tendons, bones and joints; center of mass and balance; human movement and control; ground reaction force and methodology for the human movement; the clinical analysis 3-D using the motion analysis and related tools and equipment

**SIPO 507 Physiology of Exercise**

**3(2-2-5)**

Effects of exercise, human functions; physiological reactions to physical exercise, varying levels of intensity, length and occurrence; functional capabilities of individual, a review of human movement science; practice of laboratory experiences

**SIPO 509 Evidence-Based Practice in Prosthetics and Orthotics**

**3 (1-4-4)**

Definitions and characteristics of evidence-based practices; basic principles of evidence-based practices; processes for evidence-based practices, definitions, characteristics, and sources of evidence; an evaluation and development of evidences in evidence-based practices; an integration of evidence to inform decision-making, communication and application of evidence-based practices into prosthetic and orthotic practices

**SIPO 523 Advanced Spinal Orthotics**

**2(1-2-3)**

An application of advanced biomechanics and kinesiology of spine, material science, and mechanical science; advanced components for spinal orthotics; Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM), the computerized system for treatments and monitoring, the experimental analysis, the pressure distribution inside spinal orthoses; the medical imaging analysis before and after using spinal orthoses; the treatment plan and care management for people with the associated pathologies, practices in fabrication and fitting



**SIPO 524 Seating and Other Orthotic Devices****2(1-2-3)**

An application of advanced biomechanics, kinesiology of spine and trunk, material science, mechanical science, advanced components for seating and other orthoses; Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM), the experimental analysis, the pressure distribution inside the device, the medical imaging analysis, before and after use of the device; the gait and motion analysis; the treatment plan and care management for people with associated pathologies; practising in fabrication and fitting

**SIPO 537 Medical Footwears****2 (1-2-3)**

Anatomy and the structure of medical footwears; materials, tools and equipment; characteristics and directions of the use related to the variation of the medical orthopedic footwears for ankles and foot problems or pathologies; variation of shoe, shoe construction design and its advantage, shoe making skills, sewing, fabrication techniques and shoe fitting technique by apply knowledge from research paper and textbook

**SIPO 536 Pedorthic Management for Foot Problems****2 (1-2-3)**

The management of the foot problems in clinical practices; in-depth explorations on treatment principles; problems in clinical practices; appropriate orthotic prescriptions; treatment process associated with the pedorthic management; evidence-based practices of treatments for various foot problems in current clinical practices

**SIPO 551 Clinical Practice in Prosthetics and Orthotics****3 (0-6-3)**

Clinical prosthetic and orthotic practices of advanced prosthetic and orthotic principles, to assigned patients under the supervision emphasizing on the patient assessment, prescription recommendation, fabrication techniques, fitting and adjustment; professional ethics, patient's right and good human relations



**SIPO 552 Assistive Technology for Physical Disabilities**

**3 (1-4-4)**

An assessment and prescription of appropriate assistive technology for people with physical disability and elderly persons; description and analysis of gait using related assistive technologies; appropriate training of users to use assistive technology

**SIPO 553 Technical Writing and Visualization for Prosthetics and Orthotics**

**3 (3-0-6)**

Writing and visualization; skills and attributes development in effective communication of research and clinical reports; using visual and document design; audience awareness, precision in communication, scaffolded in-depth writing and visualization projects; The development of research skills, business and clinical practice skills

**SIPO 554 Critical Appraisal of Research Literature**

**2 (2-0-4)**

Critical appraisal of scientific literature; an evaluation of research rationale, methodologies, data analysis, presentations of results and research implications to evidence-based practices, the strength and weakness assessment; critical reviews of the past and current prosthetics, orthotics, rehabilitation science and related research

**SIPO 555 Applied Fitting Techniques in Prosthetics and Orthotics**

**3(2-2-5)**

Affordability and adjustability of immediate fitting in prosthetics and orthotics; global practices in applied Fitting techniques; identification, practices and appropriate prosthetic and orthotic fitting in various situations; cultural difference, multiple limb amputations, gender or different generations

**SIPO 556 Theory and Application of International Classification of Functioning**

**1(1-0-2)**

An introduction to International Classification of Functioning, Disability, and Health (ICF); concepts of functioning, disability, and health; theory, models and principles of ICF; components of ICF, the use of ICF; applications of ICF in prosthetics and orthotics



**SIPO 557 Organization Management in Prosthetics and Orthotics**

**3(2-2-5)**

Basic principles of organization management; organization structure, human resource management, organization symbols, financial and managerial accounting, unit cost calculation; application of knowledge for organization management of prosthetics and orthotics in public and private sectors

